

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q64324

Masayuki MISHIMA

Appln. No.: 09/845,356

Group Art Unit: 1774

Confirmation No.: 2603

Examiner: Marie Rose Yamnitsky

Filed: May 1, 2001

For: LIGHT-EMITTING DEVICE

DECLARATION UNDER 37 C.F.R. § 1.132

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Masayuki Mishima, hereby declare and state:

THAT I am a citizen of Japan;

THAT I graduated from the Graduate School of Engineering, Kyoto University, in March,
1982;

THAT I became employed by Kao Corporation in April, 1982;

THAT I have been employed by Fuji Photo Film Co., Ltd., now FUJIFILM Corporation,
since July, 1991;

THAT I am the inventor of the invention described and claimed in the above-identified
application, and am familiar with the Office Action of November 12, 2008, and the rejections
contained therein.

In support of the patentability of the present invention, I have the following comments.

1. Comments on discrepancies noted by the Examiner in the Office Action

(1) First, based on the specification, Comparative Example 2 utilizes a fluorescent red light-emitting material as well as a fluorescent green light-emitting material, whereas Table 2 in the Declaration filed July 28, 2008 lists the red light-emitting material as phosphorescent.

The specification is correct, while Table 2 in the Declaration filed July 28, 2008 is incorrect. In the response to the previous Office Action, "Example 2" was corrected to "Example 3" on page 23, line 21 of the specification to correct a clerical error in Comparative Example 2. Comparative Example 2 is really based on Example 3, and the red light-emitting material used in Comparative Example 2 is the same as in Example 3, i.e., rubrene (a fluorescent material). The expression "Phosphorescent" for the red light-emitting material in Table 2 in the Declaration filed July 28, 2008 was a clerical error and should have been "Fluorescent".

(2) Second, L_{max} for Example 2 is disclosed as 3800 in the specification, whereas Table 2 in the Declaration filed July 18, 2008 lists the value as 38000.

The value "38000" in the Declaration and also in the basic Japanese specification is correct (see Table 1 of the priority document submitted on February 4, 2002, which clearly includes "38000"), and the value in the Table 1 of the present specification is a clerical error.

2. Comments on the unexpected superiority of the present invention

It is the Examiner's position that the data set forth in the Declaration filed July 28, 2008 do not demonstrate unexpectedly superior results commensurate in scope with the claims. Thus, in order to demonstrate the unexpected superiority of the present invention, the following additional experimentation was conducted by me or under my direct supervision.

Additional Examples 1 to 9:

Devices were prepared and evaluated by repeating Example 2 of the present specification except for changing the green light-emitting material, tris(2-phenylpyridine)iridium complex (G-1), and the red light-emitting material, bis(2-phenylquinoline)acetylacetonatoiridium complex (R-2), to those shown for Additional Examples 1 to 9, respectively, in the attached Table 2 (the compounds are illustrated in the attachment following Table 2).

Additional Examples 10 to 16:

Devices were prepared and evaluated by repeating Example 4 of the present specification except for changing the green light-emitting material, tris(2-phenylpyridine)iridium complex (G-1), and the red light-emitting material, bis(2-phenylquinoline)acetylacetonatoiridium complex (R-2), to those shown for Additional Examples 10 to 16, respectively, in the attached Table 2 (the compounds are illustrated in the attachment following Table 2).

As can be seen from the results presented in the attached Table 2, the present invention, with its orthometallated complex requirements as recited in the present claims, provides a very high maximum luminance L_{max} and a very high light-emitting efficiency P at a low driving voltage V_{max} for a device which contains a blue light-emitting material, a green light-emitting material, and a red light-emitting material as compared to a device which contains a blue light-emitting material, a green light-emitting material, and a red light-emitting material but does not satisfy the orthometallated complex requirements as recited in the present claims.

Thus, I conclude that the present invention provides unexpectedly superior results.

DECLARATION UNDER 37 C.F.R. § 1.132
U.S. Application No.: 09/845,356

Attorney Docket No.: Q64324

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

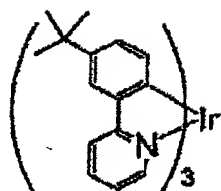
Date: May 12, 2009

By: Masayuki Mishima
Masayuki Mishima

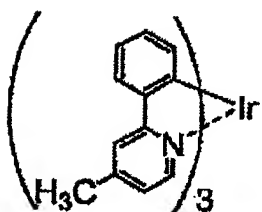
Table 2

	Blue Light-emitting Material	Green Light-emitting Material	Red Light-emitting Material	Lmax (Cd/m ²)	Vmax (V)	P (Cd/A)	Light-emitting Wavelength Peak
Example 1	B-1	G-1 (Phosphorescent)	R-1 (Fluorescent)	23000	11	18	456, 515, 604
Example 2	B-1	G-1 (Phosphorescent)	R-2 (Phosphorescent)	38000	10	25	450, 515, 599
Example 3	B-2	G-1 (Phosphorescent)	R-3 (Fluorescent)	56000	11	38	482, 515, 604
Example 4	B-2	G-1 (Phosphorescent)	R-2 (Phosphorescent)	78000	10	45	485, 515, 600
Additional Example 1	B-1	G-11 (Phosphorescent)	R-2 (Phosphorescent)	36000	10	24	456, 526, 599
Additional Example 2	B-1	G-12 (Phosphorescent)	R-2 (Phosphorescent)	35000	10	23	456, 511, 599
Additional Example 3	B-1	G-13 (Phosphorescent)	R-2 (Phosphorescent)	33000	10	23	456, 527, 599
Additional Example 4	B-1	G-14 (Phosphorescent)	R-2 (Phosphorescent)	35000	11	24	456, 520, 599
Additional Example 5	B-1	G-15 (Phosphorescent)	R-2 (Phosphorescent)	30000	10	21	456, 508, 599
Additional Example 6	B-1	G-1 (Phosphorescent)	R-11 (Phosphorescent)	33000	10	20	456, 515, 625
Additional Example 7	B-1	G-1 (Phosphorescent)	R-12 (Phosphorescent)	32000	10	21	456, 515, 625
Additional Example 8	B-1	G-1 (Phosphorescent)	R-13 (Phosphorescent)	36000	10	25	456, 515, 620
Additional Example 9	B-1	G-11 (Phosphorescent)	R-13 (Phosphorescent)	32000	11	25	456, 526, 620
Additional Example 10	B-2	G-11 (Phosphorescent)	R-2 (Phosphorescent)	75000	10	43	485, 526, 599
Additional Example 11	B-2	G-12 (Phosphorescent)	R-2 (Phosphorescent)	72000	10	40	485, 511, 599
Additional Example 12	B-2	G-13 (Phosphorescent)	R-2 (Phosphorescent)	69000	11	40	485, 527, 599
Additional Example 13	B-2	G-1 (Phosphorescent)	R-11 (Phosphorescent)	72000	10	42	485, 515, 625
Additional Example 14	B-2	G-1 (Phosphorescent)	R-12 (Phosphorescent)	68000	11	43	485, 515, 625
Additional Example 15	B-2	G-1 (Phosphorescent)	R-13 (Phosphorescent)	76000	10	47	485, 515, 620
Additional Example 16	B-2	G-11 (Phosphorescent)	R-13 (Phosphorescent)	75000	10	47	485, 526, 620
Comparative Example 1	B-1	G-2 (Fluorescent)	R-1 (Fluorescent)	2400	14	1.5	450, 520, 603
Comparative Example 2	B-2	G-2 (Fluorescent)	R-3 (Fluorescent)	5200	14	2.5	482, 516, 605
Additional Comparative Example 1	None	G-1 (Phosphorescent)	None	32000	11	25	515
Additional Comparative Example 2	None	G-2 (Fluorescent)	None	23000	15	1.8	520
Additional Comparative Example 3	None	None	R-2 (Phosphorescent)	5800	15	3.3	599
Additional Comparative Example 4	None	None	R-1 (Fluorescent)	12800	14	4	604

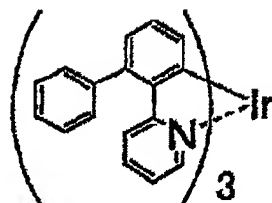
B-1: 1,1,4,4-tetraphenylbutadiene
 B-2: 1-[3,5-di(1-pyrenyl)-phenyl]pyrene
 G-1: tris(2-phenylpyridine)iridium complex
 G-2: coumarin 6
 R-1: 4-(dicyanomethylene)-2-methyl-6-(4-dimethylaminostyryl)-4H-pyran
 R-2: bis(2-phenylquinoline)acetylacetonateiridium complex
 R-3: rubrene



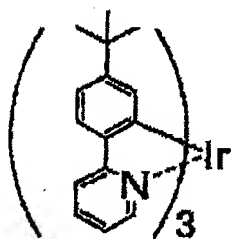
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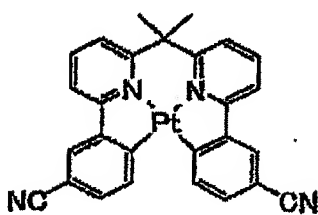
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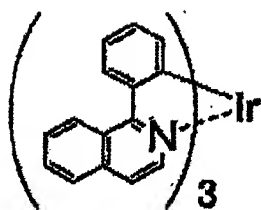
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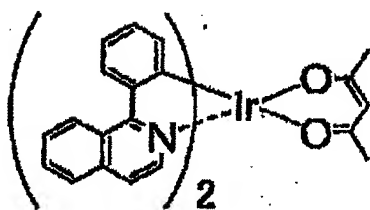
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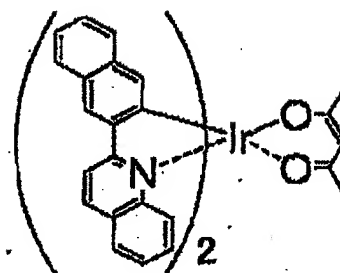
G-15



R-11



R-12



R-13